

**Remarks:**

Claims 1-11 and 45 remain for consideration in this application along with newly added claims 67 and 68. Claims 12-44 and 46-66 are canceled. In view of the foregoing amendments, the rejections of the Office Action dated April 14, 2006, are respectfully traversed.

Applicants have amended independent claims 1 and 45 to include the limitation that the composition presents a surface area of between 135-834 m<sup>2</sup>/g. Support for this amendment may be found in the examples of the present application, especially those listed in Tables 5 and 6 (pages 18 and 20) and their accompanying descriptions. The present application provides no fewer than 14 individual examples of mixed metal oxides and hydroxides which possess surface areas within the presently claimed range. Thus, the claimed range is fully enabled and supported by the specification as originally filed. Claims 67 and 68 are dependent upon claims 1 and 45, respectively, and recite the limitation that at least one of the materials making up the composition contain an element of Group IIA of the CAS Periodic Table. Support for this amendment may be found in the specification on page 5, lines 10-14.

In the Office Action, claims 1-21, 30-37, and 45 were rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui '112 or Inui '582. It is the Examiner's position that the instantly claimed product characteristics would be expected in the products formed by the processes disclosed in the reference. Applicants respectfully traverse this conclusion, and in support of this traversal, Applicants have included a Declaration under 37 C.F.R. 1.132 from Dr. Olga Koper, an expert in the field of nanoparticulate materials.

According to Dr. Koper, neither Matsui nor Inui teach formation of materials having all of the presently claimed characteristics. With respect to Matsui, Dr. Koper states that this reference

requires a heat treatment step in order to crystalize the hydroxides. See, col. 3, ll. 38-40. This heat treatment step involves heating the hydroxide precipitate to a temperature between 700°C and 1200°C. Dr. Koper states that the heat treatment step causes the atoms to move, interact, and align into larger spinel crystals having crystallite sizes of between 20-40 nm and higher. Thus, the limitation recited in claims 1 and 45 that at least one of the materials exhibits a crystallite size of up to about 4 nm by XRD analysis is not met by the Matsui materials.

Dr. Koper also notes that Table 1 of the Matsui patent teaches the formation of materials having surface areas of between 55-95 m<sup>2</sup>/g, well below the presently claimed range. Furthermore, Dr. Koper states that upon heat treatment of materials made in accordance with the present invention at a temperature of 700°C, no spinel formation was observed. In contrast, all of the Matsui materials are in fact spinels.

Similarly, Dr. Koper states that the Inui patent teaches a calcining step wherein the metal hydroxides are heated to a temperature between 500-1500°C. See, col. 2, lines 45-46. According to Dr. Koper, this calcining step would result in the formation of particles having crystallite sizes of at least 20 nm and higher for the same reasons that the heating step of Matsui would result in larger crystallite sizes. Further, Dr. Koper states that the larger crystallite sizes would lead to materials having surface areas well below the presently claimed range, likely not exceeding 100 m<sup>2</sup>/g.

Therefore, it cannot be said that Matsui and Inui materials would possess all of the characteristics of the presently claimed materials. Applicants respectfully request that these rejections be withdrawn.

Claims 1-4, 6-21, 30-32, 34-37, and 45 were rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/38282. It is the Examiner's position that the materials disclosed in the

'282 reference contain characteristics which overlap those of the presently claimed invention. However, as Dr. Koper notes in her Declaration, the '282 reference teaches materials having surface areas between 43.2-79.5 m<sup>2</sup>/g, well below the presently claimed range. See, Examples 3 and 9. Further, Dr. Koper states that the '282 reference provides no motivation to maximize the surface area of its particles as it is only concerned with light emissions of the particles when exposed to an excitation energy source. Therefore, the surface area limitation of claims 1 and 45 is not met.

Also, dependent claims 67 and 68 further distinguish the '282 reference in that they require that at least one of the materials contain an element or ion moiety of an element from Group IIA of the CAS Periodic Table (i.e., the alkaline earth metals). The '282 reference does not disclose using any alkaline earth metals in its materials. Thus, claims 67 and 68 define additional subject matter that is patentable over the '282 reference.

Applicants are including herewith a Request for Continued Examination and a Petition for a two-month extension of time along with the requisite fees.

Any additional fee which is due in connection with this amendment should be applied against our Deposit Account No. 19-0522.

In view of the foregoing, a Notice of Allowance appears to be in order and such is courteously solicited.

Respectfully submitted,

By 

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